

**WHAT IS CLAIMED IS:**

1           1. A method for processing alkene-containing exhaust  
2 gas, comprising:

3           ozonation process, wherein the alkene-containing  
4 exhaust gas reacts with ozone and the double bond is  
5 completely oxidized and broken down into small molecules;  
6 and

7           biological process, wherein the small molecules are  
8 further reacted and decomposed.

1           2. The method as claimed in claim 1, wherein the ozone  
2 process is carried out in an apparatus selected from the  
3 group consisting of a gas pipe, a packed column and any  
4 device that promotes the blending of gases and the contact  
5 among gases.

1           3. The method as claimed in claim 2, wherein the  
2 equipment that promotes the contact among gases is selected  
3 from the group consisting of venturi pipes and static  
4 blender.

1           4. The method as claimed in claim 3, the material of  
2 the venturi pipes and static blender is selected from the  
3 group consisting of stainless steel and other material that  
4 is resistant to ozone.

1           5. The method as claimed in claim 2, the processing  
2 equipment filled with a filler is selected from the group  
3 consisting of packed columns and sieve plate columns.

1           6. The method as claimed in claim 5, wherein the  
2 material of the filler or the sieve plate of the sieve plate  
3 column is selected from the group consisting of stainless  
4 steel and other material that is resistant to ozone.

1           7. The method as claimed in claim 4 or 6, wherein the  
2 filler, sieve plate, venturi pipe and the static mixer  
3 further comprise a catalytic substance that accelerates the  
4 decomposition of ozone.

1           8. The method as claimed in claim 1, further  
2 comprising a step of decomposing residual ozone before the  
3 exhaust gas entering the biological process.

1           9. The method as claimed in claim 8, wherein the  
2 decomposition of the residual ozone is carried out in a  
3 filter material compost compartment.

1           10. The method as claimed in claim 9, wherein the  
2 material filling the filter material compost compartment is  
3 selected from the group consisting of organic substances and  
4 other substances that decompose ozone.

1           11. The method as claimed in claim 10, wherein the  
2 substance that decomposes ozone is activated carbon,  $\text{MnO}_2$ ,  
3  $\text{FeO}(\text{OH})$ , or Ag.

1           12. The method as claimed in claim 1, wherein the  
2 biological process is carried out in a device selected from  
3 the group consisting of bio-filter, a bio-trickling filter  
4 and a bio-scrubber.

1           13. The method as claimed in claim 12, wherein the  
2 means by which the exhaust is introduced into the bio-filter  
3 bed is selected from the group consisting of upflow and  
4 downflow.

1           14. The method as claimed in claim 12, wherein the  
2 means by which the exhaust gas is introduced into the bio-  
3 trickling filter or the bio-scrubber is selected from the  
4 group consisting of upflow, downflow and crossflow.

1           15. The method as claimed in claim 1, wherein the  
2 ozonic process equipment and the biological process  
3 equipment are combined as a single apparatus.

1           16. The method as claimed in claim 1, wherein the  
2 ozonic process equipment and the biological process  
3 equipment are two individual apparatus.

1           17. The method as claimed in claim 1, wherein the  
2 alkene-containing exhaust gas comprises styrene, butadiene,  
3 norbornene, and acrylates.

1           18. The method as claimed in claim 17, wherein the  
2 acrylates are acrylic acetate and butyl acrylate.

1           19. The method as claimed in claim 1, wherein the  
2 noxious component of the alkene-containing exhaust gas is  
3 hydrogen sulfide, methanethiol, ethanethiol and dimethyl  
4 sulfide.

1           20.    The method as claimed in claim 1, wherein the  
2   amount of ozone added is 0.1~10 times that of the pollutant.

1           21.    The method as claimed in claim 1, wherein the  
2   amount of ozone added is 0.5~5 times that of the pollutant.

1           22.    The method as claimed in claim 1, further  
2   comprising a monitoring step for exhaust gas, in which the  
3   pollutant concentrations before and after the process are  
4   observed to adjust the ozone supply accordingly.

1           23.    The method as claimed in claim 22, wherein the  
2   inspection item in the monitoring step is selected from the  
3   group consisting of the total concentration of hydrocarbons  
4   in the exhaust gas and the concentration of the compound  
5   reactive with ozone.

1           24.    The method as claimed in claim 22, wherein the  
2   regulation of ozone supply is adjusted according to a factor  
3   selected from the group consisting of the ozone  
4   concentration and the flowrate of the ozone supply.